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ABSTRACT

The use of microcomputers and courseware for native language instruction is discussed. Five dimensions of instruction that are helpful in evaluating microcomputer use are examined: (1) student motivation; (2) educational objectives; (3) the appropriateness of the computer and related software as instructional tools; (4) the learning model underlying the instructional approach; and (5) the extent to which computer use is integrated into the native language curriculum. Observations are made based on experience in teaching Dutch as a native language in Belgium. (Author/MSE)

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REQUIREMENTS FOR THE USE OF COURSEWARE IN MOTHER TONGUE EDUCATION

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abstract

This paper discusses five dimensions from which criteria may be derived for evaluating the use of microcomputers in mother tongue classes. The dimensions include: (1) student motivation; (2) the types of learning objectives; (3) the appropriateness of the microcomputer; (4) the learning model underlying the teaching/learning process; (5) the extent to which the use of the microcomputer is integrated into the mother tongue curriculum. The dimensions are discussed on the basis of experience with the microcomputer for Dutch as a first language in Belgium.

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REQUIREMENTS FOR THE USE OF COURSEWARE IN MOTHER TONGUE EDUCATION

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0. INTRODUCTION

In a recent article Christopher Jones states "that it is not so much the methods - or even the teaching materials - that matter, so much as what the teacher does with them." (Jones 1986, 171) He rather stresses the importance of how the teacher uses the teaching materials. I think that Jones is right when he stresses the importance of the teacher's ability and attitude. In his article Jones shows for a number of existing programmes how teachers devised in a creative way various applications of each programme. I think, however, that this cannot mean that the fact that a given programme may be used creatively by the teacher for inducing various language activities by the student, implies that all these activities are automatically valuable.

My colleagues and I have some experience with microcomputers and courseware for Dutch as a first language in Belgium, in primary and secondary school, and at university. This leads us to pointing at some dimensions from which criteria may be derived that the use of courseware and microcomputers should comply with. In this paper I want to give a brief discusssion of five dimensions that seem important.

1. MOTIVATION

Of course it is forcing an open door to say that student motivation is of the utmost importance. The question is how student motivation is reached. We think that good courseware adds to intrinsic motivation. This requires that the student should be able to find out for himself that what he is learning is of practical importance to him in a not too long term, or that it satisfies his intellectual interest. I am using here the notion of 'normal functionality', as it was developed by the Dutch mother tongue pedagogue Ten Brinke (1976, 65 f.f.). Ten Brinke contrasted 'normal functionality' to 'scholastic functionality'. Mother tongue education has a scholastic functionality when the learning objectives (and/or the learning process) are primarily legitimated by school tradition, and not by the student's needs

or interest.

When we consider the courseware that is available on the market, we see that a lot of it serves scholastic functionality. As an illustration, one may think for instance of a lot of courseware in the domain of grammar. In certain countries (e.g. Belgium, The Netherlands, France) there has been a long tradition of parsing and categorizing parts of speech in primary school and in the early stages of secondary education. Given their age, this subject can only have a scholastic function for these pupils, because of the high degree of abstraction that traditional school grammar requires. The use of computers and courseware cannot provide for an intrinsic motivation in this field if the subject itself is not changed severely. The trimmings of the microcomputer, the pseudo-individualized comments by the programme ("Bravo, Peter"), the hangman-type graphics, the sounds, the challenge for competition, etc., cannot turn a fundamentally scholastic objective or subject matter into a normal-functional one.

Moreover, a lot of courseware of the drill-and-practice type rapidly becomes boring and provides for anti-motivation on the part of the students.

2. OBJECTIVES

Regularly, we get the impression that some producers of courseware do not care too much about the learning objectives and their significance, but they rather seem to have been inspired by the question which subjects lend themselves easily to the production of a computer programme. Just as for any other teaching material (textbook, tape, etc.) one should evaluate the learning objectives that it serves.

In the preceding paragraph we already mentioned the question whether the learning objectives are of a normal-functional type. Other questions should be asked as well:

- how important are the actual learning objectives that this courseware aims at ?

- do we really want our students to reach these objectives ?

- are there any important objectives or categories of objectives that are neglected in this courseware ?

- what category, in terms of a taxonomy of objectives, do these objectives belong to ?

When we consider mother tongue courseware, we are struck by the fact that the cognitive operations that the courseware seems to support, often belong to the lowest categories of cognitive

operations in terms of taxonomies of objectives. Fortunately, there is also courseware, as e.g. the well-known Storyboard, which also appeals to the higher categories of cognitive operations.

It is clear that evaluation of objectives is an important issue. However, I will not dwell longer on it, because evaluation of objectives is a highly complicated task, with both technical and philosophical dimensions, which would take too much of our time here.

3. MEDIUM

A third, very important, criterion is the appropriateness of the microcomputer and of courseware for mother tongue education.

This question has several aspects.

First of all, there are a number of programmes that offer exercises which the student could just as well make without the computer, using a textbook or paper and pencil. For any programme, we should raise the question what it can do more or better than teacher and student could do without it.

Enthusiastic articles on CALL often point at the ease with which immediate feedback and error analysis are made possible by the computer, and thus they also point at the better possibilities of adapting instruction to the learner's individual needs. We should remain critical about this. In a number of cases, e.g. a lot of drill-and-practice, it is doubtful whether the feedback or error analysis are that valuable. Feedback in terms of right or wrong, need not necessarily be helpful to the student. Error analysis is often uninformative to the learner, if it is made in terms of the subject matter, rather than in terms of the mental operations that led the student to his error. We shall return to this topic in connection with the next dimension (the learning model).

It is often said that the use of a word processor in writing instruction introduces a kind of flexibility that one cannot reach when using paper and pencil or typewriter. This is certainly true, but here too we must remain cautious. Our experience with first year university students taught us the following.
There is quite some variation in the way different writers go through the writing process. The extensiveness of pre-planning may vary widely. There are quite a number of writers whose pre-writing planning is strongly transformed during the actual formulating stage. They seem to go through at least the following stages: first they do a certain amount of pre-planning;

then they write a first draft using paper and pencil; they then critically revise this first draft (writing it made them change their first plan); then they transscribe their first draft on the computer, and in doing so they make a lot of changes, including structure, style etc.; then they revise this second draft, using a computer print-out; then they ...
These writers differ from others, whose pre-planning is more extensive, with the result that they are able to do the formulating job directly at the keyboard.

Most important to us is the acknowledgement that there is not just one uniform process of writing with the word processor, but that there is very much variation amongst individual writers. Our observation is in agreement with the distinction made by Bridwell et al. (1985)[1] They distinguish three types of writers: (i) beethovians (who conceptualize mainly during formulating); (ii) mozartians (their conceptualizing takes place before writing; during formulating they merely execute what they planned before); (iii) a mixed type of writers (they do some planning and continue conceptualizing in the formulating stage).

In the ethnographical reports on the use of word processors in writing instruction we find something striking. As these reports indicate, students are always asked to write their first draft directly on the computer. It is as if the teachers consider all their students to be mozartians. If the distinction between the three types of writers is meaningful, then this should imply that the microcomputer cannot be used in a uniform way by the different types of writers.

Another observation to be made is that in writing instruction students are often asked to work in groups of two or three. I suppose that one reason is the fact that there are just not enough microcomputers available for the students to work individually. So the students are to execute the writing assignment collaboratively, which leads them to a lot of verbal interaction with regard to planning, self-monitoring, style etc. (e.g. Dickinson 1986) Although such collaborative writing sessions might lead to better products, it is not clear whether the writing process of each individual participant improves. After all, we must be aware of the fact that most writing outside the classroom is of the individual type.

With regard to the appropriateness of the microcomputer and of courseware for mother tongue education, I would like to consider yet another aspect. In recent years mother tongue education in various European countries has been stressing the communicative aspects of language use. (cf. Herrlitz et al. 1984) One of the main objectives is to extend and to improve the student's communicative competence. In order to reach this objective theoreticians of mother tongue education advocate the necessity of exercising in 'complete communicative situations'. With writing as a possible exception, one may doubt whether the computer environment is sufficient for creating such complete communicative situations in the teaching of speaking, listening and reading. The computer seems rather suitable for exercising partial skills, such as certain technical aspects of reading, spelling and the like.

4. LEARNING MODEL

A lot of language learning at school involves some amount of training, i.e. the formation of habitual and automatic skills. One may e.g. think of verb conjugation and spelling in French, the spelling of verb forms in Dutch, the spelling of Dutch short and long vowels, etc. In these instances we have closed rule systems where the application is, in principle, fully predictable. These are areas for which a lot of courseware has been developed along the lines of drill-and- practice. In such courseware feedback is often given just in terms of 'right' or 'wrong', or the student is referred to the rules of grammar when he makes a mistake. This courseware presents a serious flaw in that the student is not made aware of the reason (the erroneous mental operation) that made him make his mistake.

For the learning of habitual and automatic skills, i.e. routines, we think that another learning model is more appropriate. We found this alternative learning model in the instructional psychology developed by C.F. van Parreren of the University of Utrecht (The Netherlands), who himself draws for some part on Russian scholars, notably P.J. Gal'perin and L. Vygotsky.[2]) We applied this learning model in a course on the spelling of Dutch verb forms and we devised a computer programme that functions as part of this course.[3]) In this way we extend in some sense the applicability of this learning model to educational software.

According to this theory, learning should be directed at the acquisition of actions or action structures. By actions, one does not mean the observable behaviour, but rather the cognitive process that is at the basis of behaviour.
Depending on the nature of the objects on which a person performs such an action, Van Parreren and Gal'perin distinguish four levels of action: the material, perceptual, verbal and mental level. They see these levels as successive steps in the learning process. Gal'perin explained this conception of the learning process by making an appeal to the so-called interiorisation principle, which he himself borrowed from Vygotsky. According to this principle, higher psychological functions originate from external, interhuman (i.e. interactive) forms of behaviour.

In order to acquire a particular action structure, the learner has to follow, according to Gal'perin, a so-called stage procedure. The successive stages are:

1 orientation;

2 the material(ized) action;

3 the verbal action;

4 the mental action.

(1) In the orientation stage, the learner builds up a representation of the action that he is to perform. With this representation in mind, he will be able to orient himself at the

moment of actual performance, e.g. at the moment that he is going to write a particular verb form.

This orientation basis includes two sorts of knowledge:

(a) knowledge of the objects or categories with which the learner is going to operate. In our case this means knowledge of the critical features necessary for identifying a particular verb form as an instance of a more general category, e.g. the characteristics of a finite verb in the present tense.

(b) operational knowledge, i.e. knowledge of the operations that have to be performed on the objects. In the case of the spelling of Dutch verb forms this includes:
- identification of an object on the basis of its features (e.g. the identification of a particular verb form as a present tense of the finite verb.
-transformation of the object. In the presently used example the transformation consists in adding the adequate ending.

In our course the orientation basis is laid during ordinary classroom instruction. The identification algorithms are constructed in a collaborative effort of teacher and students. The transformation algorithm, on the other hand, is offered by the teacher in the form of a card, containing a visual representation of the algorithm.

(2) The second stage is the stage of the material or the materialized action. In this stage, the action is performed on material objects, or as in our case, on mental objects (i.e. linguistic notions) that are present in a materialized form, namely a schematic representation of the algorithm.

Our programme consists in two different modes.
The elaborate mode of our programme was set up for this second stage. In this mode the student is offered a number of randomly chosen sentences containing a verb whose ending has to be added. The student not only has the card at his disposal, but he is offered on screen the successive questions of the algorithm. Before answering a question, or when he gives a wrong answer, he may call a help branching. As the questions are all identification questions, the help branchings present in a concise form the identification algorithms that were studied more extensively in the orientation stage. By training in this way, the student memorizes the algorithm without his attention being focused on this memorization task.

(3) In the third stage, the verbal stage, the student can use the computer programme as well, but this time in a more restricted mode. In the restricted mode the student is also offered randomly chosen sentences in which he has to add the verb ending. This time the questions of the transformation algorithm are no longer present on screen. In order to fill in the verb ending the student verbalizes the successive steps of the algorithm. To this end it is advisable that students work together in small groups of two or three, such that the group members communicate with each other about the problems to be solved. When the student fills in a wrong verb ending due to a mistake in the application of the transformation algorithm, he is offered the opportunity to go through the questions of the

algorithm, which are then presented on screen. In this way he is able to detect for himself which step was taken wrongly. We see it as a major advantage of this type of programme that it gives the student feedback in terms of the mental steps he has to go through in the problem solving procedure that is involved in the spelling of verb forms. The fact that the student himself detects his errors incites him to reflect about them and to learn from this. Thus the programme guides the student rather than offering him a ready made error analysis.

(4) The fourth, and final, stage is the stage of the mental action. When the student has memorized the algorithm and has had sufficient training in applying it, he is able to perform the actions without needing further support from a materialized form (as e.g. a card) of the algorithm. Thanks to the fact that he sufficiently controls the various parts of the action, he is now able to gradually abbreviate the procedure, i.e. that he no longer needs to answer explicitly and overtly the different questions of the algorithm before reaching the solution. In other words, he gradually automatizes the entire action.
For training in this fourth stage, the student can also use the restricted mode of the computer programme.

As a final remark on the learning model that this programme is based upon, I would say that our programme differs considerably from a lot of current courseware, in that the latter rather focuses on the products of the problem solving process, whereas our programme focuses on the process itself. It trains the student in using a problem solving procedure.

5. INTEGRATION

A last dimension on which the use of the microcomputer and courseware has to be evaluated concerns the extent to which it may be integrated naturally and functionally into the whole of the mother tongue curriculum. This is one of the things we tried to realize with the course and the computer programme that I have just sketched.

There are obvious motivational reasons for seeing to it that the use of the microcomputer be not an activity on its own. There are also good learning-theoretical reasons for requiring this integration. Integration is necessary if we want to prevent what Van Parreren (1971) called 'systems separation'. Systems separation occurs whenever a student is not able to apply in one situation what he has learned in a different context. We observe a typical example of systems separation when a student makes spelling mistakes in a writing assignment, which he does not make in the context of a dictation.
Of course, integration is not only determined by the qualities of the courseware. It also depends on the teacher's skill to achieve integration. But for the teacher to have the possibility

of integrating the use of the microcomputer in the mother tongue curriculum, the programmes that are available to him should fulfill minimal requirements.

6. CONCLUSION

As a first concluding remark, I would say that if the programmes that are available to him meet the requirements that were discussed in this paper, the teacher's ability and attitude are nevertheless of the utmost importance, as is advocated by Jones (1986).

And in the second place, I would say that the use of microcomputers does not radically change the procedures of mother tongue education. The criteria that this use should meet, are not fundamentally different from the criteria that were valid before.

Nevertheless, the microcomputer is a challenge for critically reconsidering the traditional procedures of mother tongue education.

NOTES

1) As to Bridwell et al. (1985) I rely on a reference to it given in Van der Geest et al. (1987).

2) For references in English see Van Parreren (1975, 1978); Gal'perin (1957, 1969); Daems (1986).

3) The course as such was published by my collaborators in Pepermans & Van Herck (1985). After a lot of experimentation the computer programme is about to be published as Daems (1988).

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